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Beneficial Effects of Om Chanting on Spatial and Verbal Memory, Motor Skills and Pupil to Limbus Diameter (PLD) Ratio in Young Adults with Type-D Personality

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Abstract

AIMS: The aim of this study was to assess the beneficial effects of '*OM*' chanting on spatial and verbal memory, motor skills, and pupil to limbus diameter ratio (PLD Ratio) in young adults with type D personality. **METHODS:** The present study was experimental. The subjects were a total of 40 young adults with type D personality, {males(n=20) and females(n=20)}. The sample size is 40. After obtaining written informed consent, the participants were screened for type D personality using DS14 questionnaire. The participants were instructed to sit in sukhasana and to inhalation deeply and then while exhaling should produce sound (chant) *OM* with the ability to continue until further exhalation is not possible.*OM* chanting once in a day at 8:00 daily at under the supervision of yoga teacher in college premises. The complete data before '*OM*' chanting and after '*OM*' chanting were collected subjected to statistical analysis.

- **Pupil to limbus (PLD) ratio:** PLD ratio was recorded by two box method as specified in the literature
- **Assessment of spatial and verbal memory:** Spatial and verbal memory was assessed by using spatial and verbal memory test.
- **Assessment of motor skills:** Motor skills were assessed by using 100 pin dexterity test.

RESULTS: The results of my study were that '*om*' chanting has significant impact on spatial memory, verbal memory and motor skills of people having Type-D personality. But 'om' chanting has no significant impact on the PLD of people having Type-D personality. **CONCLUSION:** Our study concludes evidence for beneficial effects of '*OM*' chanting on spatial and verbal memory, motor skills and PLD ratio in young adults with type D personality. Since there is not much studies have conducted on this, our study is a steppingstone towards providing the beneficial effects of '*OM*' chanting in young adults with type D personality.

Keywords
O' Connor Tweezer Dexterity test, Pupil to Limbus Diameter (PLD) ratio, Type D personality.

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INTRODUCTION

In 1995, Shirley teles[2].
conducted a study regarding 'autonomic changes during om meditation the study revealed following results that, 7 meditators showed reduction in hr significantly during meditation compared to control period. significant and comparable decrease in finger plethysmogram amplitude during the meditation and control periods compared to the preceding periods. non-significant trend of reduction in oxygen consumption following meditation.
In 2005, Johan denollet[3].
Studied 'DS14 standard assessment of negative affectivity, social inhibition and type-d personality' the findings of the study were that,

- there is a lack of short, easy to use measures of na & si in psychosomatic research.
- factor analysis and reliability criteria provided evidence for its 2- factor structure internal consistency.
- the construct validity of the ds14 in the 5-factor personality space was done by correlations with neuroticism/ introversion and scale level factor analysis.
- scores on the na and si scale were stable over a 3-month period of time and were not mood, state – dependent; age and sex are frequently studied as individual difference variable in psychosomatic research.
- it is feasible to include global personality trait as well.

During 2010, Sanjay Kumar [4].
conducted a study regarding 'meditation on om: relevance from ancient texts and contemporary science'

- the result suggests that, during meditation, neural processing at the middle, latency auditory evoked potentials precludes using them as the method of choice for assessing the effects of meditation.
- as a result, there was a small but consistent reduction in the peak latency of the nb wave (the maximum negativity occurring between 35 and 65 ms). this reduction observed during the 3 sessions also.

During 2016, arati amin [1].
conducted a study regarding, beneficial effects of 'om' chanting on depression, anxiety, stress, and cognition in elderly women with hypertension.
after 6 months of 'om' chanting, systolic blood pressure, diastolic blood pressure, pulse rate, depression, anxiety, stress decreased significantly. mmse scores improved.
In 2017, aruna sajeevan [5]
Found the correlation of pupil to limbus diameter ratio (pld ratio) with blood pressure and pulse rate.

- the study concluded with a result that positive correlation of bp and pulse rate with pld ratio.

MATERIALS AND METHODS

Present study was conducted in Department of physiology Little Flower Institute of Medical Sciences, Angamaly. A total of 40 young adults with type D personality (males (n=20) and females (n=20)) were included in the present study after obtaining written, informed consent. Participants were screened for type D personality using DS 14 questionnaire[3].

Inclusion criteria:

1. Male and females within the age group of 18-25
2. Type D personality
3. Not suffering with any major disease
4. Not under any kind of therapy or treatment
5. Not practicing any other stress management technique
6. Willing to perform *OM* chanting regularly

Exclusion criteria

1. Male and females18<and>25 the age group
2. No Type D personality
3. Those who suffering with any major disease
4. Those who under any kind of therapy or treatment
5. Those who practicing any other stress management technique
6. Those who is not willing to perform *OM* chanting regularly

Chanting: *OM*

Participants will be instructed to sit in sukhasana and to inhalation deeply and then while exhaling should produce sound (chant) *OM* with the ability to continue until further exhalation is not possible. *OM* chanting will be performed Om chanting once in a day at 8:00 daily at under the supervision of yoga teacher in college premises. [1]

Pupil to limbus (PLD) ratio measurement:

PLD ratio was recorded by two box method as specified in the literature. [8] **Image capture**
For at least 5 minutes before imaging procedure the subjects were exposed to ambient light levels
By using Samsung Galaxy J7, the whole images were captured for PLD measurement.
A Lux meter (Model no. MTQ 1010A, MetroQ) with a range of 0-20,000Lux, and resolution of 1-1000Lux, was used for Illuminance measurement for the ambient light conditions.
At constant luminance (230 lux) PLD ratio was measured for all the participants. {Figure1}

Image analysis

To measure PLD ratios Microsoft Office PowerPoint 2010 was used. PLD ratio was recorded by two box method as specified in the literature. [8] By using the rectangle tool of the drawing toolbar, two boxes were drawn, in a way that the heights of the two boxes were equal and superimposed. For representing the limbal and pupillary diameters, respectively the widths of the larger and smaller box were adjusted manually. For each PLD ratio limbus and pupillary diameters were estimated in the same or parallel para-horizontal axis that was visible {figure:2,3,4,5}

Assessment of spatial and verbal memory:

Spatial and verbal memory was assessed by using spatial and verbal memory test. [6] A total of 10 subjects were assessed for their spatial and verbal memory at a time. The 40 subjects were assessed in such a manner.

For testing the spatial memory, the testing material included a total of 11 slides. of these slides the first 10 slide consists of different geometrical drawings and symbols. The 11th slide included a mathematical problem. the slides were projected on a screen allowing 10 seconds for each slide. After all the 10 slides the 11th slide which contains the mathematical problem was projected on the screen. After that, the subjects were asked to recall 10 slides and asked to write in the paper given to them, within a time limit of 60 seconds. The scoring method was easy that for each correct answer a score of 1 was given and for incorrect answer 0 score was given. And total score for spatial memory calculated for 10/10 (10 out of 10).

For testing the verbal memory, the testing material included a total of 11 slides. of these slides the first 10 slide consists of standard nonsense syllables of 3 letters eg. XOL. The 11th slide included a mathematical problem. the slides were projected on a screen allowing 10 seconds for each slide. After all the 10 slides the 11th slide which contains the mathematical problem was projected on the screen. After that, the subjects were asked to recall 10 slides and asked to tell verbally within a time limit of 60 seconds. The scoring method was easy that for each correct answer a score of 1 was given and for incorrect answer 0 score was given. And total score for verbal memory calculated for 10/10 (10 out of 10).

The Spatial and verbal memory was assessed before starting *OM* chanting procedure (pre -test score) and after the completion of the intervention that is after 4 months (post-test score). In such a manner base line data and post interventional data were collected. {Figure:6 and 7}

Assessment of motor skills:

Motor skills were assessed by using O' Connor Tweezer Dexterity test [7].

The components of this test include the following things:

- A board that having 100 holes.
- A cup that holds 100 pins.

The subjects were asked to insert the pin by using their dominant hand using the tweezer

The time required for inserting 100 pins into the holes were considered as the score. {figure:8 and 9}

Data analysis: Data was analyzed by SPSS 20.0. Student t test will be used to test the significance of difference.

DISCUSSION

Gives the results of the t test performed to compare of mean scores of pre-test and post test scores of different variables under study. With respect the spatial memory the mean pre-test score is 6.65 with a standard deviation of 1.74753. While the mean score of post-tests is 9.15 with a standard deviation of 0.80224. There is an increase of 3.5 in the mean score post test conducted after the experiment. The calculated value of t is 9.682 which is statistically significant at 0.01 level (t=9.682, p >0.001). Hence, the hypothesis that the '*OM*' chanting has a significant impact on the spatial memory of people having type D personality H2 has been accepted.

With respect the verbal memory the mean pre-test score is 5.82 with a standard deviation of 1.82416. While the mean score of post-tests is 9.15 with a standard deviation of 0.79703. There is an increase of 3.25 in the mean score post test conducted after the experiment. The calculated value of t is 11.645 which is statistically significant at 0.01 level (t=9.11.645, p >0.001). Hence, the hypothesis that the '*OM*' chanting has a significant impact on the verbal memory of people having type D personality H3 has been accepted.

With respect the PLD the mean pre-test score is 0.39 with a standard deviation of 0.09126. While the mean score of post-tests is 0.39 with a standard deviation of 0.01044. There is a difference of 0.0003 in the mean score post test conducted after the experiment. The calculated value of t is .025 which is statistically not significant at 0.01 level (t=.025, p >0.001). Hence, the hypothesis that the '*OM*' chanting has a significant impact on the PLD of people having type D personality H4 has been rejected.

With respect the motor skill the mean pre-test score is 4.49 with a standard deviation of 0.52981. While the mean score of post-test is 3.88 with a standard deviation of 0.37416. There is a decrease of 0.61 in the mean score post test conducted after the experiment.

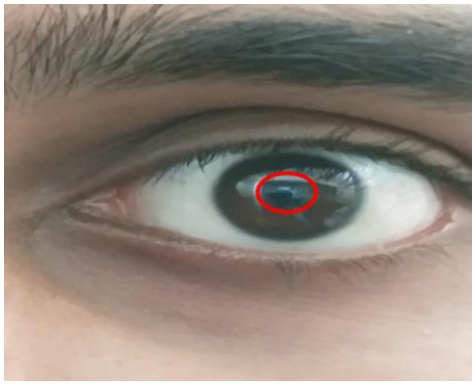
The calculated value of t is 9.760 which is statistically significant at 0.01 level (t=9.760, p >0.001). Hence, the hypothesis that the '*OM*' chanting has a significant impact on the motor skill of people having type D personality H1 has been accepted.

The present study is intended to provide further evidence for beneficial effects of *OM* chanting on spatial and verbal memory, motor skills and PLD ratio in young adults with type D personality. And the result of the study was statistically significant. {figure:10}

Figure1: Lux meter

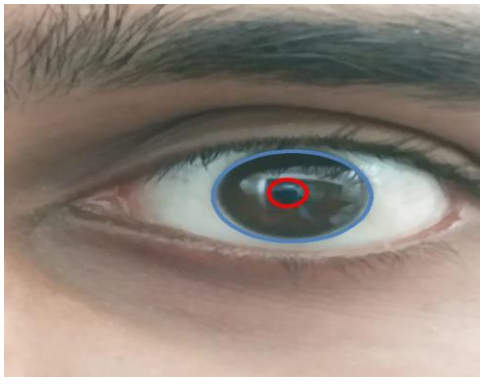
Step 1.

Figure2: Image analysis of eye – Step 1



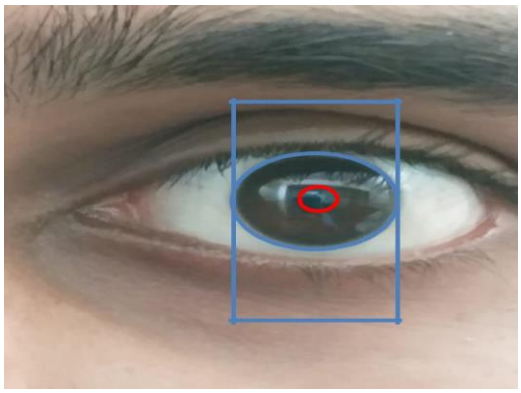
Step 2

Figure 3: Image analysis of eye – Step 2



Step 3

Figure 4: Image analysis of eye – Step3



Step-4

Figure 5: Image analysis of eye – Step 4

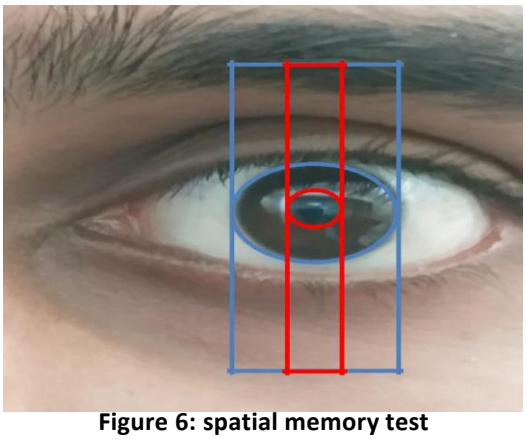


Figure 6: spatial memory test

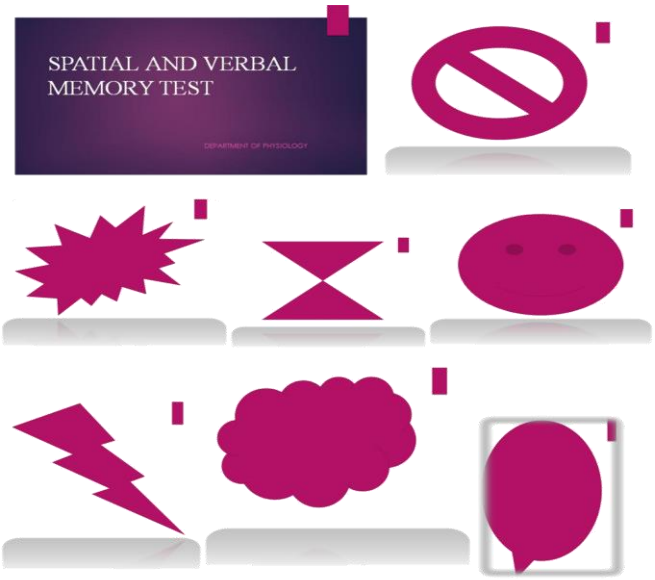


Figure 7: verbal memory test

Figure8: 'O'Connor Tweezer Dexterity test instrument

Figure9: O' Connor Tweezer Dexterity test by female subjects and male subjects

Fig 10: Mean Scores of Pre-Test and Post Test for Different Variables

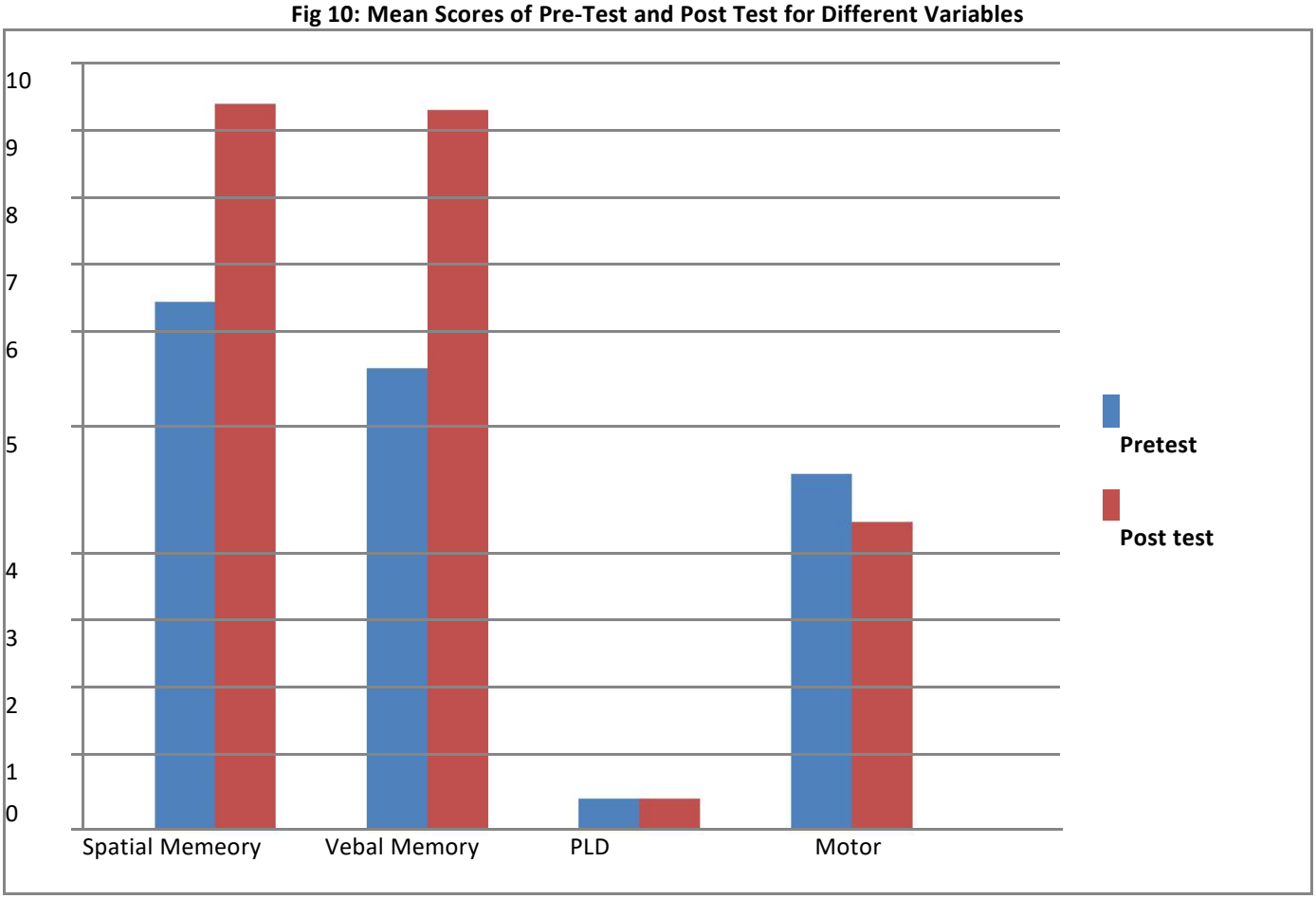


Fig:11 Normal P-P Plot of Spatial 1

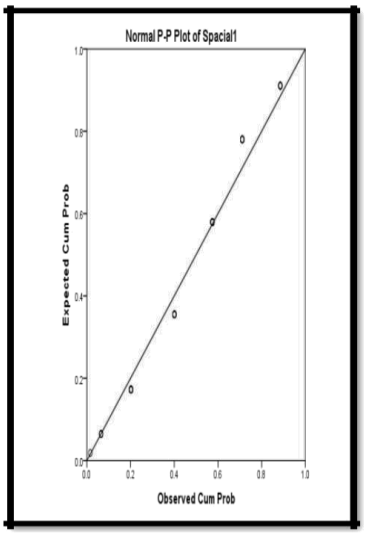


Fig:12 Normal P-P Plot of Verbal 1

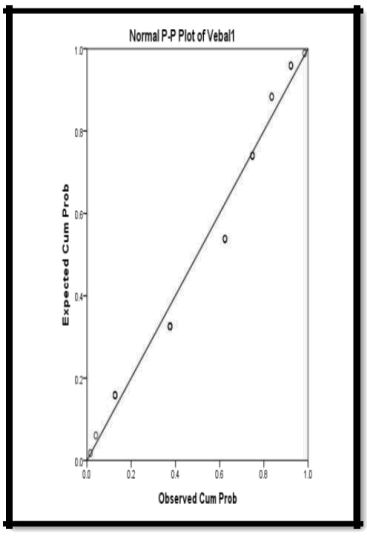


Fig:13 Normal P-P Plot of PLD1

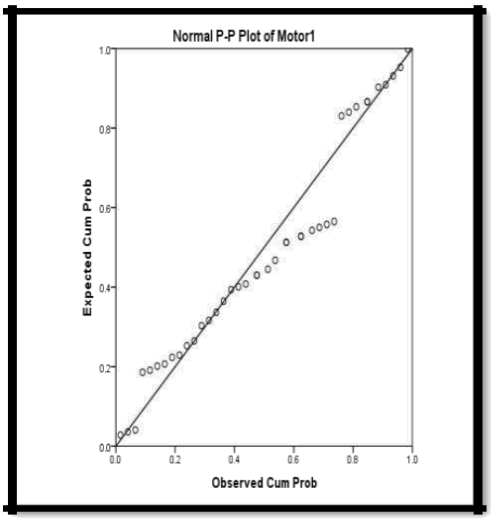


Fig: 14 Normal P-P Plot of Motor 1

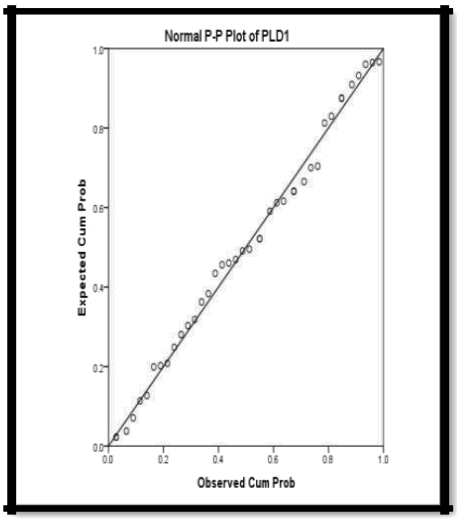


Fig :15 Normal P Plot of Spatial 2

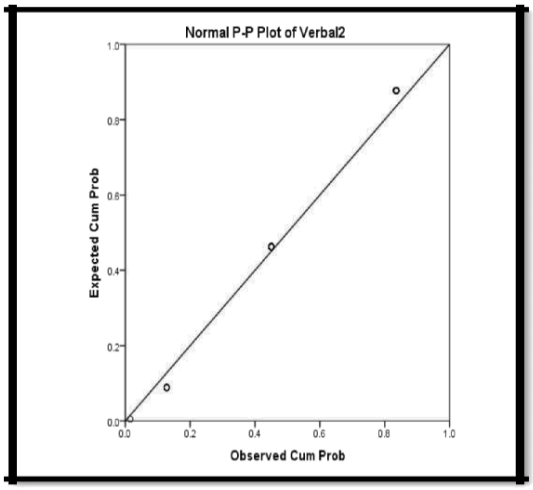


Fig:16 Normal P-P Plot of Verbal 2

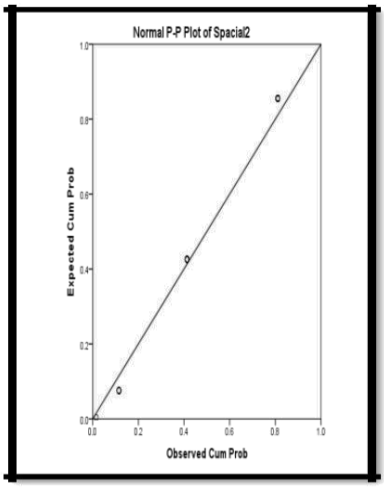


Fig:17 Normal P-P Plot of PLD 2

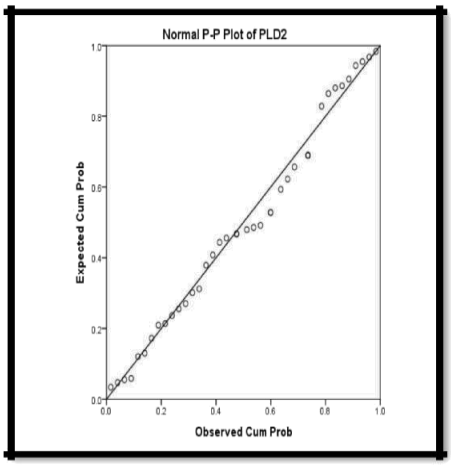
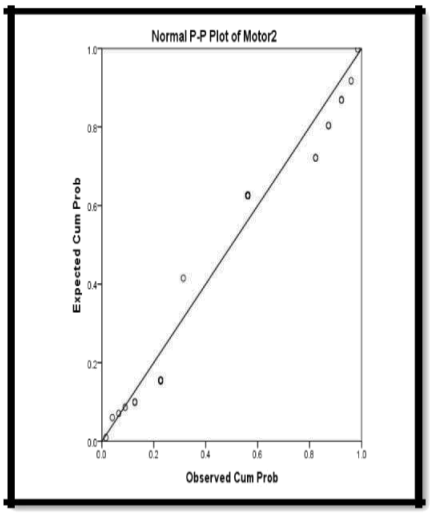


Fig:18 Normal P-P Plot of Motor 2



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CONCLUSION

Our study provides evidence for beneficial effects of '*OM'* chanting on spatial and verbal memory, motor skills and PLD ratio in young adults with type D personality. As scientific evidence regarding the effects of OM chanting are sparse, our study is a steppingstone towards providing the beneficial effects of '*OM'* chanting in young adults with type D personality.

REFERENCES

1. 1.Arati Amin, Sai Sailesh Kumar, Archana Rajagopalan. Beneficial effects of OM chanting on depression, anxiety, stress and cognition in elderly women with hypertension. *Indian Journal of Clinical Anatomy and Physiology, July-September 2016;3(3);253-255.*
2. Telles S, Nagarathna R, Nagendra HR. Autonomic changes during 'OM' meditation. Indian J PhysiolPharmacol. 1995; 39:418–20.
3. Denollet J. DS14: standard assessment of negative affectivity, social inhibition, and Type D personality. Psychosom Med 2005; 67:89–97
4. Sanjay Kumar, HR Nagendra, NK Manjunath, KV Naveen and Shirley Telles. Meditation on*OM*: Relevance from ancient texts and contemporary science.Int J Yoga. 2010; 3(1):2-5.
5. Aruna Sajeevan, Kumar Sai Sailesh. Correlation of pupil to limbus diameter ratio (PLD RATIO) with blood pressure and pulse rate.Int J Pharma Bio Sci 2017 July; 8(3):(B) 12-16.
6. Manjunath NK, Telles S. Spatial and verbal memory test scores following yoga and fine arts camps for school children. Indian J Physiol Pharmacol 2004; 48: 353-356.
7. Diva Lugassy, Yafi Levanon, Raphael Plio, Asaf Shelly, Gal Rosen, Avi Meirowitz, Tamar Brosh. Predicting the clinical performance of dental students with a manual dexterity test. PLoS ONE 13(3): e0193980.
8. Mojumder DK, Patel S, Nugent K, Detoledo J, Kim J, Dar N, Wilms H. Pupil to limbus ratio: Introducing a simple objective measure using two-box method for measuring early anisocoria and progress of pupillary change in the ICU.J Neurosci Rural Pract. 2015 Apr-Jun;6(2):208-15.